Maricopa County
Department of Transportation

2001
State of the System Report

BRIDGE MANAGEMENT SYSTEM

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MCDOT BRIDGE MANAGEMENT SYSTEM

Maricopa County is currently responsible for maintaining 356 bridges and structures (box culverts) as well as planning for the design and construction of new bridges and structures. As a result of the 1998 Bridge Investment Study conducted by INCA Engineers, MCDOT has standardized its evaluation and prioritization of bridge projects within the County. This process is now the basis for MCDOT's bridge project recommendations for the County's five-year Transportation Improvement Program as well as a long-term planning tool for future funding of bridge construction projects. The following information on bridges and scoring methodologies has been excerpted from the Bridge Investment Study (BIS) report. Last year (1999) and for the next two years (2000/2001) MCDOT will be focusing its bridge resources on scour protection projects. This scour protection mitigation will ultimately save possible future costly bridge repair or replacement.

BACKGROUND

In 1999, MCDOT had 242 on-system bridges (bridges and box culverts 20 feet or longer) and 104 off-system structures (box culverts and bridges shorter than 20 feet) inspected on a biannual basis. Today MCDOT has 257 on-system bridges and 99 off-system structures inspected on a biannual basis. In keeping with Federal requirements, the record of these inspections is forwarded to the ADOT's Bridge Management Group no later than April of each year. The State Bridge Inventory System (SBIS), which MCDOT and Arizona Department of Transportation (ADOT) use, is a combination of three databases: the inventory database, the inspection database, and a maintenance database. Since MCDOT inspects their entire bridge inventory every two years, total inventory comparisons will be analyzed every even year beginning in 2000.

It is important to understand that the SBIS is only an inventory database and not a management system. In 1993, MCDOT participated as a member of the Bridge Management System ISTEA Technical Committee. This was a statewide team chaired by ADOT to form guidelines and procedures for the implementation of PONTIS, a Bridge Management System. To this date, MCDOT continues to gather the necessary inspection data but has not implemented the bridge management system (BMS) (i.e., Deterioration Rate Models and Cost Models) because ADOT is still forming guidelines and procedures. ADOT and MCDOT have begun inputting information into PONTIS. PONTIS requires 5-6 cycles of data input (1 cycle=2 years) before it becomes operational. Once sufficient information is loaded, MCDOT can begin implementation of PONTIS. Full implementation of PONTIS is anticipated in or around 2005 and will be used for bridges and structures over 20-feet in length.

DATA GATHERING AND ANALYSIS

Definition of Bridge and Bridge Types

In accordance with the American Association of State Highway and Transportation Officials (AASHTO) “A Transportation Glossary”, a “bridge” is defined as “an structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between under copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.”

There are five basic types of bridges classified according to the manner in which the load is supported.

- Beam
- Arch
- Truss
- Cable – Supported
- Frame

Evaluation Criteria

In 1997, the Maricopa County Bridge Investment Study (BIS) recognized the need to evaluate bridges separately from roadway projects. The following information identifies MCDOT’s method of scoring and prioritizing bridge projects.

In discussions with then County Bridge Engineer, four categories of bridge projects were chosen for evaluation and prioritization:

- Rehabilitation Projects
- Replacement Projects
- Replace Dip Sections with New Structures
- New Bridge Projects (not included in major road projects)

Rehabilitation Projects

The rehabilitation of a bridge includes restoring or improving its original load carrying capacity and/or increasing its roadway clear width to provide for traffic or pedestrian use. In the past, MCDOT used a procedure based only on the sufficiency rating of the existing bridge and judgment of the Bridge Engineer to recommend bridge rehabilitation projects. In the quest for a more formal evaluation and prioritization procedure the use of the sufficiency, rating will continue to be used along with other factors.

MCDOT will continue to use the sufficiency rating because it is readily obtainable, updated every two years, and has been the foundation of other agencies. Federal Highway Administration (FHWA) publication *Bridge Inspector=s Training Manual/90* explains the Sufficiency Rating as the following: AThe calculation of a bridge sufficiency rating is based on an empirical formula by National Bridge Inspection Standards (NBIS) which assigns points on the basis of approximately 19 separate Structure Inventory and Appraisal items@. The sufficiency rating consists of the following factors and weighting criteria:

Structural Condition	=	55.0%
Serviceability	=	14.0%
Functionality	=	13.0%
ADT	=	11.5%
Detour Length (Less than 37 miles)		6.5%
		100%

Special Reductions to Sufficiency Rating

Public inconvenience amounts to only 6.5 percent for a detour length up to 37 miles. An additional 5.0 percent penalty is applied for detour length between 37 and 99 miles. Detours beyond 99 miles are treated as if the length were 99 miles.

A new major bridge (Thru Truss, Arch, Suspension, Cable-Stayed or Movable) is penalized 5 percent. Therefore, the maximum sufficiency rating would be 95 percent. Lack of traffic safety features (bridge railings, transitions, approach guardrail, and approach guardrail ends) results in only a 3 percent penalty. Accidents on a bridge are not considered.

The Sufficiency Rating only indicates the bridge's sufficiency to remain in service. If the sufficiency rating was used as the only evaluation criteria, the following conclusions could be drawn:

- A bridge could have a rating of 18 - 82 based solely on its structural condition, serviceability, and functionality without regard to its use or size. It could receive Federal replacement funds or be 3 points from being eligible for rehabilitation funds. (Bridges scoring below 80 are eligible for rehabilitation funds, while bridges scoring below 50 are eligible for replacement funds.)

- No consideration is given to the remaining useful life of the structure.

- No consideration is given to the cost of rehabilitation or the associated benefits.

- Two or more bridges could have the same sufficiency rating. There would be no way to prioritize without additional factors.

For these reasons, in order to evaluate and prioritize rehabilitation projects, other factors are considered in order for the County to decide how to maximize their expenditure of dollars. The following additional factors are used.

- Functional Obsolescence
- Load Limits
- Traffic Safety on or Near the Bridge
- Hydraulics
- Remaining Useful Life
- Average Daily Traffic
- Public Inconvenience - Emergency Use
- Benefit/Cost Ratio

Using these evaluation factors, a 100 point scoring system is used and explained as follows:

Sufficiency Rating:	=	(15 points)
Functional Obsolescence:	=	(5 points)
Load Limited:	=	(5 points)
Traffic Safety (2 parts):	=	(15 points)
A. Accident Rate (5 points)		
B. Accident Severity (10 points)		
Hydraulics:	=	(10 points)
Remaining Useful Life:	=	(10 points)
Average Daily Traffic:	=	(15 points)
Public Inconvenience - Emergency Use:	=	(10 points)
Benefit/Cost Ratio:	=	(15 points)
		100 Points

1. Sufficiency Rating:

The sufficiency rating is calculated after each in-depth bridge inspection. This rating is readily obtainable and updated every two years. The eligibility for Federal funding is determined by a bridges' sufficiency rating. Bridges scoring below 80 are eligible for rehabilitation funds, while bridges scoring below 50 are eligible for replacement funds. The distribution of total available points for Sufficiency Rating is as follows:

Sufficiency Rating - 15 points (maximum)

50	-	60	=	15
61	-	70	=	10
71	-	80	=	5

2. Functional Obsolescence:

A functionally obsolete bridge may be structurally sound but does not meet current standards due to inadequacies in deck geometry, clearances, or approach roadway

alignment. The distribution of total available points for Functional Obsolescence is as follows:

Functional Obsolescence - 5 points (maximum)

Yes	=	5
No	=	0

3. Load Limited:

A load-limited bridge is structurally deficient due to structural condition, need for rehabilitation, or structure closure. The allowable safe load able to cross the bridge in its current structural condition is posted at each end of the bridge. MCDOT currently has one load-limited bridge. The distribution of total available points for Load Limited is as follows:

Load Limited - 5 points (maximum)

< 5 Ton	=	5
> 5 Ton and < 36 Ton	=	linear point distribution
> 36 Ton	=	0

4. Traffic Safety:

The distribution of total available points for Traffic Safety is as follows:

A + B = Total Points

A. Crash Rate

This is a measurement of number of crashes on a roadway segment as compared to the average daily traffic volume on the roadway. Three-years of crash data is used for each segment. The following formula is then used to determine the annual rate of accidents per million vehicle miles of travel on the roadway. Typically the higher the rate the more unsafe the roadway.

Accident Rate = 5

$$\frac{\text{(Total Accidents/Year) } 1{,}000{,}000}{\text{(ADT) (Project Length) (365 Days/Year)}}$$

However, the accident rate is not be used alone. For instance, a roadway with a very low volume of traffic might have a very high accident rate with just a few accidents over a three-year period. The roadway may not actually be as unsafe as a road with a similar rate based on a larger traffic volume. In addition to the accident rate, a measurement of the severity of the accidents is also used.

B. Accident Severity

This is the measurement of the cost of accidents based on the number of five types of accidents. The types of accidents and their costs are derived from the Arizona Department of Transportation's *Benefit/Cost Economic Analysis* published in August

1997. The accident types and their associated dollar values are:

Accident Severity = 10

Fatal Accidents	$	2,600,000
Incapacitating	$	180,000
Non Incapacitating	$	36,000
Possible Injury	$	19,000
Property Damage	$	2,000

$$\frac{\text{((Accident Severity Type/Year) Cost) } 1{,}000{,}000}{\text{(ADT) (Project Length) (365 Days/Year)}}$$

Note: Points are assigned on how well each project does in comparison to all others.

Three-years of accidents (1996, 1997, and 1998) on a roadway segment are multiplied times their cost factors and totaled to give an overall cost for the roadway segment. The following formula is then used to determine an annual cost of accidents per million vehicle miles of travel on the roadway. The annual costs of all other roadway projects are then statistically compared to each other using a normalized scoring process. Points are assigned based on how well each project does in comparison to all others. No fixed target averages are used at this time. As further data becomes available through the Safety Management System, it will be possible to determine appropriate County average accident rates by classification of roadways.

Project Length used in Accident Rate and Accident Severity equations equals the length of bridge and approach roadway including transitions under consideration. The calculations for both Accident Rates and Accident Severity are the same used by the approved MCDOT Road Rating System for the Capital Improvement Program.

5. Hydraulics:

Bridges that cross natural watercourses are subject to unpredictable natural flows with the associated potential for scour, erosion, long-term degradation, and overtopping. These bridges are considered scour vulnerable bridges. Scour stable bridges are considered safe from catastrophic failure due to scour or erosion associated with a determinant discharge. Scour critical bridges are considered to be at risk of catastrophic failure due to scour or erosion produced from the overtopping, the 500-year event, or the100-year discharge.

MCDOT Bridge Department recently identified ten (10) bridges that are scour critical. Nine (9) are recommended for added scour protection measures or replacement and one (1) will be continuously monitored as agreed between MCDOT and FHWA.

The distribution of total available points for Hydraulics is as follows:

Hydraulics - 10 points (maximum)		
Scour Critical	=	10
Potential Scour Problems	=	5
No Problem	=	0

6. Remaining Useful Life:

Predicting the remaining life of a bridge with any degree of accuracy requires knowledge of the bridge's condition, loading history and maintenance record. For steel structures AASHTO has published the "*Guide Specifications for Fatigue Design of Steel Bridges (1989)*" and the "*Guide Specifications for Fatigue Evaluations of Existing Steel Bridges (1990)*". These references give an analytical approach to determining the remaining life of a steel structure. Concrete bridges are more difficult to evaluate and require the judgment of the Engineer. AASHTO states:

> "A concrete bridge need not be posted for restricted loading when it has been carrying normal traffic for an appreciable length of time and shows no distress. This rule will apply to bridges for which details of the reinforcement are not known. However, the bridge shall be inspected at frequent intervals for signs of distress which may develop until such time as the bridge is either strengthened or replaced."

Bridges are estimated to have a structural life of 75 years. Consideration needs to be given for bridges that are close to the end of their expected life. Widening a 50-year old bridge may not be the best solution when protection of traffic for a rural road requires widening. The distribution of total available points for Remaining Useful Life is as follows:

Remaining Useful Life (in years) - 10 points (maximum)		
<10	=	10
11 -25	=	5
25>	=	0

7. Average Daily Traffic:

The Average Daily Traffic (ADT) is used to determine the location of most need for the project. All other criteria being equal the higher the volume the greater number of County residents would be served. The distribution of total available points for Average Daily Traffic is as follows:

Average daily Traffic - 15 points (maximum)				
	>	8000	=	15
1001	-	8000	=	10
	<	1000	=	5

Note: ADT ranges were taken from the MCDOT Roadway Design Manual Table 2.1 for rural and urban roadways.

8. Public Inconvenience - Emergency Use:

Consideration is given for public inconvenience and emergency vehicles use if the bridge was taken out of service. This criteria is based on the Two Way ADT and minimum detour length in miles. The distribution of total available points for Public Inconvenience - Emergency Use is as follows:

Public Inconvenience - Emergency Use - 10 points (maximum)

Existing Two Way ADT x Min. Detour Length (miles)

>	50,000	=	10
25,001	-50,000	=	5
0	-25,000	=	0

9. Benefit/Cost Ratio:

Bridge projects should return dollar value benefits that exceed the costs to plan, design, construct, operate, and maintain. Projects should not be selected where costs exceed benefits unless there is a compelling reason to do otherwise (i.e. a bridge serving a small amount of people with the bridge as their only route). The target value used for this factor is a benefit/cost ratio of 1.0. Projects that have a positive ratio of one or greater will receive points up to 15. Projects with ratios below 1.0 will receive no points.

MCDOT has previously used MicroBENCOST for calculating benefit/cost ratios for roadway and bridge projects. However, beginning in 2000, MCDOT will use a more planning level benefits/cost program called StratBENCOST. StratBENCOST can analyze individual road or bridge projects as well as analyzing complete roadway systems. Similar accuracy is expected from this program. However, the system that MCDOT adopts for bridge projects will, as a minimum, incorporate the benefit/cost components previously stated. The distribution of total available points for Benefit/Cost Ratio is as follows: (These B/C numbers may change to reflect Stratbencost criteria)

Benefit/Cost Ratio - 15 points (maximum)

	>	1.6	=	15
1.2	-	1.59	=	10
1.0	-	1.19	=	5
	<	1.00	=	0

Overall Scoring System

The overall scoring system can also be viewed by looking at elements of each of the evaluation factors for total weighting of each evaluation criteria.

Table 1: Total Weighting of Evaluation Criteria

Structural Condition	Sufficiency Rating (.55 x 15)	=	**8.2**		
	Load Limit	=	**5.0**		
	Remaining Useful Life	=	**10.0**		
				Total	**23.2**
Serviceability	Sufficiency Rating (.14 x 15)	=	**2.1**		
				Total	**2.1**
Functionality	Sufficiency Rating (.13 x 15)	=	**2.0**		
	Functional Obsolescence	=	**5.0**		
				Total	**7.0**
ADT	Sufficiency Rating (.115 x 15)	=	**1.7**		
	ADT	=	**15.0**		
				Total	**16.7**
Public Inconvenience	Sufficiency Rating				
	Public Inconvenience	=	**10.0**		
				Total	**11.0**
Traffic Safety	Traffic Safety	=	**15.0**		
				Total	**15.0**
Hydraulics	Hydraulics	=	**10.0**		
				Total	**10.0**
Benefit/Cost	Benefit/Cost	=	**15.0**		
				Total	**15.0**
				Total	**100.0**

REPLACEMENT OF EXISTING BRIDGES

Funding availability for bridge rehabilitation projects are often, time limited. Therefore, it is very important to implement a rehabilitation project that will give the best return of the dollars spent. Replacement of a bridge may cost several times more than the cost to rehabilitate, but a new bridge if properly designed and constructed will last longer than a rehabilitated bridge. Therefore, the cost to rehabilitate should be carefully considered and estimated.
In addition, other items such as the bridge's functionality, sufficiency rating, and the engineer's judgment should be considered before replacement of an existing structure. MCDOT recommends replacement of an existing bridge should be considered when all four of the following conditions are met:

1. If the cost of rehabilitation is 55% of the cost of a new bridge and,
2. The existing bridge is classified as functionally obsolete and,
3. The sufficiency rating of the existing bridge is less than 50 and,
4. The Judgment of the Bridge Engineer

Prioritization of two or more identical bridge replacement projects are based solely on their benefit/cost ratio.

REPLACEMENT OF DIP SECTION WITH A NEW STRUCTURE

When considering the replacement of dip sections, the most important factors were determined to be detour length and ADT, number of days the road is closed, accident rate and severity, future traffic congestion and benefit/cost ratio. The following criteria is used to evaluate and prioritize the replacement of dip sections with new structures, and is based on a 100 point scoring system, which is explained as follows:

The first two elements (detour length and road closure) are used due to their affect on public inconvenience (i.e. road user value of time and additional vehicle cost).

Detour Length:	=	(15 points)
Road Closures:	=	(25 points)
Future Volume to Capacity Ratio:	=	(30 points)
Traffic Safety (2 parts):	=	(15 points)
A. Accident Rate (5 points)		
B. Accident Severity (10 points)		
Benefit/Cost Ratio:	=	(15 points)
		100 Points

1. Detour Length:

The minimum detour length in miles around a flooded dip section times the Two Way ADT is calculated and assigned points up to 15. The distribution of total available points for **Detour Length** is as follows:

Detour Length - 15 points (maximum)

Existing Two Way ADT x Min. Detour Length (miles)

>	-	50,000	=	15
25,001	-	50,000	=	10
0	-	25,000	=	5

2. Road Closures:

There are 300 dip sections that are monitored for road closure during storm events and releases of water from upstream dams. The top ten dip sections have been ranked and assigned up to 25 points. The ranking is determined by multiplying the Two Way ADT by the number of days the particular dip section is closed in a 5-year period. MCDOT currently has records of all road closures throughout the County. The distribution of total available points for Road Closures is as follows:

Road Closures - 25 points (maximum)

Ranking = Existing Two Way ADT x No. of Days closed in 5-years

Rank	1	-	2	=	25
	3	-	4	=	20
	5	-	6	=	15
	7	-	8	=	10
	9	-	10	=	5
	11	or	>	=	0

3. Future Volume to Capacity Ratio:

Volume to capacity ratio (V/C) is an indicator of congestion on the roadway. V/C ratio measures the capacity or how many vehicles the roadway can accommodate based on its design as compared to the actual peak hour traffic volumes that occur on the roadway. The traffic volumes used for each project are the projected volumes twenty years in the future or the latest MAG Future Transportation Model projections. The MCDOT target average is 75 percent of capacity. This equates to a Level of Service C based also on the roadways functional classification in the MCDOT Roadway Design Manual. The MAG Transportation Model calculates the ratios. A V/C ratio of .75 receives 15 points. Projects with more congestion receive more than 15 points and those with less congestion receive less than 15 points.

This criteria is used to determine future impacts to developing areas. The distribution of total available points for Future Volume to Capacity Ratio is as follows:

Future Volume to Capacity Ratio - 30 points (maximum)

0	-	0.35	=	5
0.36	-	0.55	=	10
0.56	-	0.75	=	15
0.76	-	0.85	=	25
0.86	-	1.00	=	30

Note: V/C ratios are taken from the MAG Transportation Model.

4. Traffic Safety:

This criteria is the same as that described for Rehabilitation Projects however the accidents considered are those directly related to the dip section (i.e. water related, poor sight distance, etc.). The distribution of total available points for Traffic Safety is as follows:

Traffic Safety - 15 points (maximum)

A + B = Total Points
A. Accident Rate = 5

$$\frac{\text{(Total Accidents/Year) } 1{,}000{,}000}{\text{(ADT) (Project Length) (365 Days/Year)}}$$

B. Accident Severity = 10

Fatal Accidents	$	2,600,000
Incapacitating	$	180,000
Non Incapacitating	$	36,000
Possible Injury	$	19,000
Property Damage	$	2,000

$$\frac{\text{((Accident Severity/Year) Cost) } 1{,}000{,}000}{\text{(ADT) (Project Length) (365 Days/Year)}}$$

Note: Points are assigned on how well each project does in comparison to all others.

5. Benefit/Cost Ratio:

This criterion is the same as that described for Rehabilitation Projects. The distribution of total available points for Benefit/Cost Ratio is as follows:

Benefit/Cost Ratio - 15 points (maximum)

>		1.60	=	15
1.2	-	1.59	=	10
1.0	-	1.19	=	5
<		1.00	=	0

SCOUR PROTECTION PROJECTS

Scour protection projects have been MCDOT's focus since 1997. The first phase of MCDOT's scour program began in 1997. A study was conducted to determine the bridges and structures with scour problems. The second phase included design of scour mitigation. This began in 1998. The third and final phase is construction. This began in 1999 and will continue through 2001. Scour critical bridges have been targeted for mitigation to help prevent costly rehabilitation or replacement prior to the remaining life expectancy of the facility. Some examples of completed Scour Protection Projects are:

- Rittenhouse Road Bridge at the Queen Creek Wash
- Bush Highway Bridge at the Salt River
- Deer Valley Road Bridge at an unnamed wash near 189th Avenue

NEW BRIDGE PROJECTS

New bridge projects are projects that require the installation of a bridge and approaches where none currently exist and the bridge is not included in a major road project. An example of such a project is:

- 116th Avenue at the Salt River

The most important consideration for this type of project is benefit/cost. Additional consideration should be given if the new bridge fits with the regional transportation system plan, funding sponsorship, and the projected congestion once the facility is in place. The following four (4) criteria are used to evaluate and prioritize new bridge projects not included as part of a major road project and is based on a 100 point scoring system.

Benefit/Cost Ratio:	=	(50 points)
Transportation System Plan:	=	(15 points)
Joint Sponsorship (2 part):	=	(15 points)
Local Partnership Contributions (10 points)		
Incl. in a Local Capital Improvement Program (5 points)		
Future Volume to Capacity Ratio:	=	(20 points)
		100 Points

1. Benefit/Cost Ratio:

This criteria is the same as that described for Rehabilitation Projects only the point system is increased due to the importance this factor has on limited funds available and to receive the most value for the County residents. The distribution of total available points for Benefit/Cost Ratio is as follows:

Benefit/Cost Ratio - 50 points (maximum)

	>	1.6	=	50
1.2	-	1.59	=	35
1.0	-	1.19	=	20
	<	1.00	=	0

2. Transportation System Plan:

Fifteen (15) points are assigned for bridges located on a primary roadway system and 10 for secondary roadway system. Bridges located on local roadway system receive no points. This criteria was assigned to determine the importance of the project to the regional roadway system. The distribution of total available points for Transportation System Plan is as follows:

Transportation System Plan - 15 points (maximum)

Primary Roadway	=	15
Secondary Roadway	=	10
Local Roadway	=	0

3. Joint Sponsorship:

A. Local Partnership Contributions

All projects that are within or adjacent to an incorporated city or town may have to have a local government matching amount, in accordance with MCDOT's Transportation System Plan funding matrix. The County target goal is 25 percent. Therefore, projects that receive a contribution from a city or town in excess of 25 percent will receive more than five points. Those with contributions less than 25 percent will receive less than five points. Projects could also have partners such as State or Federal agencies, land developers, and Indian communities. However, projects that are strictly within the unincorporated portion of Maricopa County and have no opportunity for a local match will automatically receive 10 points.

B. Included in a Local Transportation Improvement Program

If a project is already included or is agreed to be included in a local government TIP or other agency TIP it will receive 5 points. The intent of this factor is to encourage

local governments to actively plan for a project in conjunction with their own TIP. Projects that are not currently in a local TIP or will not be included in a local TIP in the future will receive no points. Projects that are strictly within the unincorporated portion of Maricopa County will automatically receive 5 points.

The calculation of points for Joint Sponsorship is the same used by MCDOT in their Road Rating System for the Transportation Improvement Program. The distribution of total available points for Joint Sponsorship is as follows:

Joint Sponsorship - 15 points (maximum)

A + B = Total Points

A. Local Partnership Contributions - 10 points (maximum)

> 50%	=	10
45%	=	9
40%	=	8
35%	=	7
30%	=	6
25%	=	5
20%	=	4
15%	=	3
10%	=	2
5%	=	1
< 5%	=	0

Unincorporated areas of Maricopa County without an opportunity for a local match will automatically receive 10 points.

B. Included in a Local Transportation Improvement Program - 5 points

If a project is already included or is agreed to be included in a local government TIP or other agency TIP it will receive 5 points.

Projects that are strictly within the unincorporated portion of Maricopa County will automatically receive 5 points.

4. Future Volume to Capacity Ratio:

This criteria is the same as that described for Replacement of Dip Section Projects only the point system is increased in order to have a balance between this and the other factors. The distribution of total available points for Future Volume to Capacity Ratio is as follows:

Future Volume to Capacity Ratio - 20 points (maximum)

0.00	-	0.35	=	0
0.36	-	0.55	=	5
0.56	-	0.75	=	10
0.76	-	0.85	=	15
0.86	-	1.00	=	20

Note: V/C ratios are taken from the MAG Future Transportation Model.

REPLACEMENT OF EXISTING BRIDGES

1. Cost of rehabilitation is 55% of the cost of a new bridge and
2. Bridge is functionally obsolete and
3. Sufficiency Rating is less than 50
4. Judgment of the Bridge Engineer

If all four conditions are met, the bridge should be considered for replacement.

RECOMMENDATIONS FOR TIP PROGRAMMING PROCEDURES

Each year, MCDOT reviews the highest rated bridge projects from the following subcategories as previously described:

TIP Projects

- Replacement of Existing Bridges
- Replace Dip Sections with New Structures
- New Bridge Projects (not included in major road projects)

Operation/Maintenance Projects

- Bridge Rehabilitation Projects

In any given year, the budget allocation may not support inclusion of top rated bridge projects in the TIP Program. When this occurs, a decision will have to be made based on the rating criteria and professional engineering judgment.

RECOMMENDED BRIDGE MANAGEMENT SYSTEM (BMS) MODIFICATIONS

Until PONTIS is fully implemented, no additional modifications to the bridge analysis process are anticipated. MCDOT will continue to add inspection data results into PONTIS. After a minimum of five inspection cycles (2-years each) of data input, PONTIS will be operational. Implementation of PONTIS should satisfy FHWA in the event they require all agencies responsible for bridges to have an operating BMS before Federal funds will be allocated for repair, rehabilitation or replacement of bridges. Full implementation of PONTIS is recommended as soon as practical.

CURRENT STATUS OF MCDOTS BRIDGE MANAGEMENT SYSTEM

MCDOT currently has all bridge elements inventoried and recorded into the State Bridge Inventory System (SBIS). The NBIS database, as of March 1997, was imported into PONTIS. Prior to implementation of PONTIS, MCDOT's bridge group personnel will be trained in the use of PONTIS. Once sufficient information is loaded into PONTIS, MCDOT will begin using the program.

NEW ADDITIONS TO MCDOT'S BRIDGE MANAGEMENT SYSTEM

This year, 2000, MCDOT began an Asset Management program for MCDOT's bridge inventory. A fiscal value has been established for each facility. This value will have a straight-line depreciation value based on the total life expectancy of the facility. For example, if a bridge has a life expectancy of 75 years, each year the value of the bridge will be reduced by 1/75 of its original construction cost. This year MCDOT's bridge and structure inventory asset valuation is estimated at $128,984,000. This amount breaks down as follows: Bridges: $87,186,000; Structures =>20 feet long: $24,661,000: and Structures <20 feet long: $4,620,000. Table 2 below is a tabular recount of this information.

Table 2: Value and Remaining Life of County Structures

	Value of Culverts <20' Wide	Value of Culverts >=20' Wide	Value of Bridges	Remaining Life of Culverts <20' Wide	Remaining Life of Culverts >=20' Wide	Remaining Life of Bridges
Total	$4,619,997	$24,661,485	$87,185,671			
Average	$46,667	$167,765	$830,340	53	70	82
Max:	$303,600	$702,720	$10,389,969	131	133	148
Min:	$1,949	$8,818	$43,407	9	25	15
Median:	$39,595	$128,707	$252,531	59	64	64
Count:	99	147	110	99	147	110

	Replacement Value	Remaining Value
Average Structure Value:	$530,885	$455,896

2000 BRIDGE INVENTORY HIGHLIGHTS

Bridge Inventory Modifications

In 1999, there were 242 bridges and 104 other structures in MCDOT's bridge inventory. In 2000, MCDOT's bridge inventory consists of 257 bridges and 99 other structures. 15 bridges or structures were added to the inventory and five bridges or structures were removed from the inventory. These five bridges or structures were lost due to annexations. A re-examination and cleaning of the information currently in the bridge inventory also resulted in the reallocation of four structures less than 20-feet in length to four structures greater than 20-feet in length.

Federal Funding Eligibility Comparisons:

In 1999, MCDOT identified 10 bridges or structures eligible for federal rehabilitation funds and five bridges or structures eligible for federal replacement funds. In 2000, 39 bridges and/or structures are eligible for federal rehabilitation funds and one bridge is eligible for federal replacement funds. This sudden rise in the number of bridges and structures eligible for federal rehabilitation funds is due to the fact that the sufficiency ratings for 31 structures along the Sun Valley Parkway have been downgraded from a rating of 80.5 for 1999 to a rating of 78.1 for 2000.

Potential Federal Fund Projects vs. Overall MCDOT Inventory:

In 1999, the percentage of bridges and/or structures eligible for federal funds was 4.3%. In 2000, the percentage increased to 8.9%. Again, this sharp increase is due to the numbers of structures along the Sun Valley Parkway. Without these structures, the percentage of bridges and/or structures eligible for federal funds would have been 2.5%. This continues to suggest that based on the current inspection data, the vast majority of bridges and/or structures in Maricopa County are generally in excellent condition.

Notable Sufficiency Rating Changes to MCDOT's Bridges and Structures

There were three notable sufficiency-rating changes (declines greater than (>) five points or increases less than (<) five points in individual facilities since their last review. All three facilities were along the Sun Valley Parkway and may be attributable to a cleansing of previous data in the inventory. However, due to the number of structures along the Sun Valley Parkway (88 total), and the amount of the facilities that fell below an 80 sufficiency rating (37 structures), we recommend close tracking of these facilities. If the rate of deterioration continues, or increases, a remedial action plan will be required. Table 3, below will be used to track the 88 structures along the Sun Valley Parkway. The structures without sufficiency rates have missing information and will be corrected in the spring inventory cycle.

Table 3: Sufficiency Ratings Changes 1999-2000

STRUCT #	FEATURES	FACILITY	SUFF RATE 2000	SUFF RATE 1999	SUFF CHANGE	YEAR CONST
7645	Wash	Sun Valley Pkwy-01	80.54	80.50	0.04	1989
7646	Wash	Sun Valley Pkwy-02	80.54	80.50	0.04	1989
7647	Wash	Sun Valley Pkwy-03	79.52	80.50	-0.98	1989
7648	Wash	Sun Valley Pkwy-04	80.54	80.50	0.04	1989
7649	Wash	Sun Valley Pkwy-05	87.13	88.10	-0.97	1989
7650	Wash	Sun Valley Pkwy-06	87.13	88.10	-0.97	1989
7651	Wash	Sun Valley Pkwy-07	80.54	80.50	0.04	1989
7652	Wash	Sun Valley Pkwy-08	79.52	80.50	-0.98	1989
7653	Wash	Sun Valley Pkwy-09	80.54	80.50	0.04	1989
990134	Wash	Sun Valley Pkwy-10	95.92	95.90	0.02	1989
7654	Wash	Sun Valley Pkwy-11	80.54	80.50	0.04	1989
7655	Wash	Sun Valley Pkwy-12	80.54	80.50	0.04	1989
7656	Wash	Sun Valley Pkwy-13	80.54	80.50	0.04	1989
990135	Wash	Sun Valley Pkwy-14	95.92	95.90	0.02	1989
990136	Wash	Sun Valley Pkwy-15	95.92	95.90	0.02	1989
7657	Wash	Sun Valley Pkwy-16	80.54	80.50	0.04	1989
7658	Wash	Sun Valley Pkwy-17	80.54	80.50	0.04	1989
7659	Wash	Sun Valley Pkwy-18	79.52	80.50	-0.98	1989
990137	Wash	Sun Valley Pkwy-19	95.92	95.90	0.02	1989
990138	Wash	Sun Valley Pkwy-20	95.92	95.90	0.02	1989
7660	Wash	Sun Valley Pkwy-21	80.54	80.50	0.04	1989
7661	Wash	Sun Valley Pkwy-22	80.54	80.50	0.04	1989
990139	Wash	Sun Valley Pkwy-23	95.92	95.90	0.02	1989
7662	Wash	Sun Valley Pkwy-24	88.15	88.10	0.05	1989
7663	Wash	Sun Valley Pkwy-25	80.54	80.50	0.04	1989
990140	Wash	Sun Valley Pkwy-26	95.92	95.90	0.02	1989
990141	Wash	Sun Valley Pkwy-27	95.92	95.90	0.02	1989
990142	Wash	Sun Valley Pkwy-28	95.92	95.90	0.02	1989
990143	Wash	Sun Valley Pkwy-29	95.92	95.90	0.02	1989
990144	Wash	Sun Valley Pkwy-30	95.92	95.90	0.02	1989
990145	Wash	Sun Valley Pkwy-31	95.92	95.90	0.02	1989
990146	Wash	Sun Valley Pkwy-32	95.92	95.90	0.02	1989
7664	Wash	Sun Valley Pkwy-33	80.54	80.50	0.04	1989
7665	Wash	Sun Valley Pkwy-34	80.54	80.50	0.04	1989
7666	Wash	Sun Valley Pkwy-35	79.52	80.50	-0.98	1989
990147	Wash	Sun Valley Pkwy-36	95.92	95.90	0.02	1989
7667	Wash	Sun Valley Pkwy-37	96.2	80.50	15.70	1989
7668	Wash	Sun Valley Pkwy-38	80.54	80.50	0.04	1989
990148	Wash	Sun Valley Pkwy-39	95.92	95.90	0.02	1989
990149	Wash	Sun Valley Pkwy-40	95.92	95.90	0.02	1989
990150	Wash	Sun Valley Pkwy-41	95.92	95.90	0.02	1989
7669	Wash	Sun Valley Pkwy-42	80.54	80.50	0.04	1989
7670	Wash	Sun Valley Pkwy-43	80.54	80.50	0.04	1989
7671	Wash	Sun Valley Pkwy-44	80.54	80.50	0.04	1989
7672	Wash	Sun Valley Pkwy-45	79.1	80.50	-1.40	1989
7673	Wash	Sun Valley Pkwy-46	78.1	80.50	-2.40	1989
990189	Wash	Sun Valley Pkwy-47		80.50		1989
990190	Wash	Sun Valley Pkwy-48		80.50		1989
7674	Wash	Sun Valley Pkwy-49	78.1	88.10	-10.00	1989

STRUCT #	FEATURES	FACILITY	SUFF RATE 2000	SUFF RATE 1999	SUFF CHANGE	YEAR CONST
7675	Wash	Sun Valley Pkwy-50	78.1	80.50	-2.40	1989
7676	Wash	Sun Valley Pkwy-51	78.1	80.50	-2.40	1989
7677	Wash	Sun Valley Pkwy-52	78.1	80.50	-2.40	1989
7678	Wash	Sun Valley Pkwy-53	78.1	80.50	-2.40	1989
7679	Wash	Sun Valley Pkwy-54	78.1	80.50	-2.40	1989
7680	Wash	Sun Valley Pkwy-55	78.1	80.50	-2.40	1989
7681	Wash	Sun Valley Pkwy-56	78.1	80.50	-2.40	1989
7682	Wash	Sun Valley Pkwy-57	78.1	80.50	-2.40	1989
990191	Wash	Sun Valley Pkwy-58		88.10		1989
7683	Wash	Sun Valley Pkwy-59	78.1	80.50	-2.40	1989
7684	Wash	Sun Valley Pkwy-60	78.1	88.10	-10.00	1989
7685	Wash	Sun Valley Pkwy-61	78.1	80.50	-2.40	1989
7686	Wash X-ing Access Ramp	Sun Valley Pkwy-62	96.99	97.00	-0.01	1989
990192	Wash	Sun Valley Pkwy-63		80.50		1989
990193	Wash	Sun Valley Pkwy-64		80.50		1989
7687	Wash	Sun Valley Pkwy-65	78.1	80.50	-2.40	1989
7688	Wash	Sun Valley Pkwy-66	78.1	80.50	-2.40	1989
990194	Wash	Sun Valley Pkwy-67		80.50		1989
7689	Wash	Sun Valley Pkwy-68	78.1	80.50	-2.40	1989
7690	Wash	Sun Valley Pkwy-69	78.1	80.50	-2.40	1989
7691	Wash	Sun Valley Pkwy-70	78.1	80.50	-2.40	1989
990195	Wash	Sun Valley Pkwy-71		80.50		1989
7692	Wash	Sun Valley Pkwy-72	78.1	80.50	-2.40	1989
990196	Wash	Sun Valley Pkwy-73		80.50		1989
7693	Wash	Sun Valley Pkwy-74	78.1	80.50	-2.40	1989
7694	Wash	Sun Valley Pkwy-75	78.1	80.50	-2.40	1989
7695	Wash	Sun Valley Pkwy-76	78.1	80.50	-2.40	1989
990197	Wash	Sun Valley Pkwy-77		80.50		1989
7696	Wash	Sun Valley Pkwy-78	78.1	80.50	-2.40	1989
7697	Wash	Sun Valley Pkwy-79	78.1	80.50	-2.40	1989
7698	Wash	Sun Valley Pkwy-80	78.1	80.50	-2.40	1989
7699	Wash	Sun Valley Pkwy-81	78.1	80.50	-2.40	1989
7700	Wash	Sun Valley Pkwy-82	78.1	80.50	-2.40	1989
7701	Wash	Sun Valley Pkwy-83	78.1	80.50	-2.40	1989
7702	Wash	Sun Valley Pkwy-84	78.1	80.50	-2.40	1989
7703	Wash	Sun Valley Pkwy-85	78.1	80.50	-2.40	1989
990198	Wash	Sun Valley Pkwy-86		80.50		1989
7704	Wash	Sun Valley Pkwy-87	78.1	80.50	-2.40	1989
7705	Wash	Sun Valley Pkwy-88	78.1	80.50	-2.40	1989

SYNOPSIS OF MCDOT'S BRIDGE PROJECTS

Bridge Projects in the MCDOT FY 2001-2005 TIP

Currently MCDOT has 16 bridge and structure projects in the current TIP. These projects include scour protection, replacement, new design, widening, and minor modification and evaluation. Refer to Table 4 for a list of the projects.

Table 4: Bridge Projects in the MCDOT FY 2001-2005 TIP

STATUS	SUFF RATE	FEATURES	FACILITY	LOCATION	IMPROVEMENT
FY 1999	82.8	Agua Fria River	Indian School Road	0.5 Mi E/O El Mirage Rd	Scour Protection
FY 1999	98.7	Agua Fria River	Mc-85highway - Fas 371	0.5 Mi W/O El Mirage Rd	Scour Protection
FY 1999	43.7	Avondale Wash	Mc-85 Highway - Fas 371	0.5 Mi W/O Bullard Ave	Replace Deficient Bridge W/Pipe
FY 2000	76.9	Cave Creek Wash	Carefree Highway	1 Mi W/O Cave Creek Rd	Scour Protection
FY 2000		Eastern Canal	Chandler Hgts. Road	0.25 Mi W/O Gilbert Rd	Replace Pipe With Box Culvert
FY 2000	97.2	Gila River	Tuthill Road	0.5 Mi S/O Beloat Rd	Scour Protection
FY 2000	99.2	Hassayampa River	Old Us80 - Fas 415	500' E/O Salome Hwy	Scour Protection
FY 2000	91.8	New River	Peoria Avenue - Fau7033	0.25 Mi E/O 99th Ave	Add Sidewalks To Bridge
FY 2000	63.1	Queen Creek Wash	Power Road	0.2 Mi S/O Queen Creek Rd	Evaluate Need To Replace Ex Bridge
FY 2000	90.7	Queen Creek Wash	Rittenhouse Road	0.25 Mi N/O Cloud Rd	Scour Protection
FY 2000	94.4	Salt River	Bush Highway - Fas 388	At Blue Point	Scour Protection
FY 2000-2001		New River	Deer Valley Road	W/O 75th Avenue	Replace Dip Crossing W/ New Bridge
FY 2000-2001		Salt River	Mckellips Road	E/O Alma School Rd	Construct 3-Lane Bridge
FY 2000-2002		Eastern Canal	Queen Creek Road	0.5 Mi E/O Gilbert Rd	Replace Pipe With Box Culvert
FY 2001	92.9	Rid Canal	Airport Road	O.5 Mi N/O Lower Buckeye Rd	Widen 2-Lane To 5-Lane
FY 2001	88.6	Salt River	Alma School Road	300' S/O Mckellips RD	North - Grade Control Structure

Bridges & Structures Eligible for Federal Replacement Funds (Sufficiency Rating <50)

The Federal Highway Administration guidelines stipulate that when a bridge's sufficiency rating falls below a score of 50, the bridge becomes eligible for federal replacement funds. In 2000, the Gillespie Dam Bridge was the only bridge or structure in MCDOT's inventory that had a sufficiency rating of less than 50. This is MCDOT's only bridge that has a load limitation. The Gillespie Dam Bridge is an important part of Maricopa County's overall transportation system network. In an event that requires the closure of State Route 85, the Gillespie Dam Bridge becomes the only other rational link between Phoenix and Gila Bend. However, under normal operating conditions the Gillespie Dam Bridge receives very little daily traffic. Therefore, there is no eminent plan to rehabilitate or replace this bridge. A

Candidate Assessment Report is recommended for this bridge and will be considered in the upcoming 2001 fiscal year. Gillespie Dam Bridge is also listed in the National Register of Historic Places (NHRP).

Bridges & Structures Eligible for Federal Rehabilitation Funds (Sufficiency Rating 50 to 80)

The Federal Highway Administration guidelines stipulate that when a bridge's sufficiency rating falls between a score of 50 and 80, the bridge becomes eligible for federal rehabilitation funds. The following Table 5 is a list of bridges and structures in MCDOT's inventory that have sufficiency ratings between 50 and 80. Please note that the majority (37 of 47) of the following facilities are located along the Sun Valley Parkway. Although eligible for federal rehabilitation funds, these structures will be monitored for one additional inspection cycle (2-years). If additional deterioration continues or increases, remedial action will be considered.

Table 5: Bridges & Structures Eligible for Federal Rehabilitation Funds

STRUCT #	FEATURES	FACILITY	SUFF RATE 2000	SUFF RATE 1999	SUFF CHANGE	YEAR CONST
7647	Wash	Sun Valley Pkwy-03	79.52	80.50	-0.98	1989
7652	Wash	Sun Valley Pkwy-08	79.52	80.50	-0.98	1989
7659	Wash	Sun Valley Pkwy-18	79.52	80.50	-0.98	1989
7666	Wash	Sun Valley Pkwy-35	79.52	80.50	-0.98	1989
7672	Wash	Sun Valley Pkwy-45	79.1	80.50	-1.40	1989
7673	Wash	Sun Valley Pkwy-46	78.1	80.50	-2.40	1989
7674	Wash	Sun Valley Pkwy-49	78.1	88.10	-10.00	1989
7675	Wash	Sun Valley Pkwy-50	78.1	80.50	-2.40	1989
7676	Wash	Sun Valley Pkwy-51	78.1	80.50	-2.40	1989
7677	Wash	Sun Valley Pkwy-52	78.1	80.50	-2.40	1989
7678	Wash	Sun Valley Pkwy-53	78.1	80.50	-2.40	1989
7679	Wash	Sun Valley Pkwy-54	78.1	80.50	-2.40	1989
7680	Wash	Sun Valley Pkwy-55	78.1	80.50	-2.40	1989
7681	Wash	Sun Valley Pkwy-56	78.1	80.50	-2.40	1989
7682	Wash	Sun Valley Pkwy-57	78.1	80.50	-2.40	1989
7683	Wash	Sun Valley Pkwy-59	78.1	80.50	-2.40	1989
7684	Wash	Sun Valley Pkwy-60	78.1	88.10	-10.00	1989
7685	Wash	Sun Valley Pkwy-61	78.1	80.50	-2.40	1989
7687	Wash	Sun Valley Pkwy-65	78.1	80.50	-2.40	1989
7688	Wash	Sun Valley Pkwy-66	78.1	80.50	-2.40	1989
7689	Wash	Sun Valley Pkwy-68	78.1	80.50	-2.40	1989
7690	Wash	Sun Valley Pkwy-69	78.1	80.50	-2.40	1989
7691	Wash	Sun Valley Pkwy-70	78.1	80.50	-2.40	1989
7692	Wash	Sun Valley Pkwy-72	78.1	80.50	-2.40	1989
7693	Wash	Sun Valley Pkwy-74	78.1	80.50	-2.40	1989
7694	Wash	Sun Valley Pkwy-75	78.1	80.50	-2.40	1989
7695	Wash	Sun Valley Pkwy-76	78.1	80.50	-2.40	1989
7696	Wash	Sun Valley Pkwy-78	78.1	80.50	-2.40	1989
7697	Wash	Sun Valley Pkwy-79	78.1	80.50	-2.40	1989
7698	Wash	Sun Valley Pkwy-80	78.1	80.50	-2.40	1989

STRUCT #	FEATURES	FACILITY	SUFF RATE 2000	SUFF RATE 1999	SUFF CHANGE	YEAR CONST
7699	Wash	Sun Valley Pkwy-81	78.1	80.50	-2.40	1989
7700	Wash	Sun Valley Pkwy-82	78.1	80.50	-2.40	1989
7701	Wash	Sun Valley Pkwy-83	78.1	80.50	-2.40	1989
7702	Wash	Sun Valley Pkwy-84	78.1	80.50	-2.40	1989
7703	Wash	Sun Valley Pkwy-85	78.1	80.50	-2.40	1989
7704	Wash	Sun Valley Pkwy-87	78.1	80.50	-2.40	1989
7705	Wash	Sun Valley Pkwy-88	78.1	80.50	-2.40	1989
9289	Rid Canal	91st Avenue	78.2	N/A	N/A	1972
	Drainage Ditch	99th Avenue	76.9	N/A	N/A	1964
9825	Cave Creek Wash	Carefree Highway	76.9	N/A	N/A	1983
990164	Drainage Ditch	Cotton Lane Fas-295	75.4	N/A	N/A	1940
990169	Drainage Ditch	El Mirage Road	69.0	N/A	N/A	1979
990118	Powerline Floodway	Ellsworth Road	73.9	N/A	N/A	1968
9154	Queen Creek	Power Road	63.1	N/A	N/A	1955
990121	RWCD Canal	Queen Creek Road	71.6	N/A	N/A	1969
8570	Drainage Ditch	RH Johnson Blvd	69.5	N/A	N/A	1979
990182	Drainage Ditch	RH Johnson Blvd	68.0	N/A	N/A	1979

Bridge & Structure Projects Scored in 2000

Currently MCDOT has 13 bridge and structure projects in the project pool. These projects are re-scored each year along with new bridge and structure projects. Top scoring projects will advance to their next respective level (i.e. CAR to DCR, DCR to Design or Construction, and Design to Construction). The following Table 6 is a list of the pool projects.

Table 6: Bridge & Structure Projects Scored in 2000

STATUS	ON ROAD	AT LOCATION	TOTAL PTS	RPT	PROJ DESCRIP	DISP	SUPERVISOR DISTRICT
Scored / Idle	Hawes Rd	Sanokai Wash	1.787536	Car	Replace A Low Water Crossing With A Bridge.	Car	District 1 – Fulton Brock
Scored / Idle	Ocotillo Rd	Eastern Canal	0.9126545	Car	Install New Box Culvert To Accommodate The Ultimate Roadway Cross Section.	Car	District 1 – Fulton Brock
Scored / Idle	Riggs Rd	Sanokai Wash	1.904536	Car	Replace A Low Water Crossing With A Five Lane Bridge	Car	District 1 – Fulton Brock
Scored / Idle	Sossaman Rd	Queen Creek	6.497195	Car	Replace An Undersized Culvert With A 68-Foot Wide Bridge	Car	District 1 – Fulton Brock
To Be Considered For Tip	Gilbert Rd	Salt River	20.24653	Dcr	Replace Bridge And Adjacent Low Water Crossing With A 6-Lane Bridge.	Design	District 2 – Don Stapley & District 5 - Mary Rose Wilcox
Tip For Design	Mckellips Rd	Salt River	27.33333	Dcr	Replace Low Water Crossing With A 6-Lane Bridge.	Design	District 2 – Don Stapley & District 5 - Mary Rose Wilcox
Tip For Design	Power Rd	Queen Creek Wash	45.23134	Dcr	Replace Existing Bridge With A Wider Bridge That Can Convey 100-Yr Flow.	Design	District 1 – Fulton Brock

STATUS	ON ROAD	AT LOCATION	TOTAL PTS	RPT	PROJ DESCRIP	DISP	SUPERVISOR DISTRICT
Tip For Design	Chandler Heights Rd	Eastern Canal	13.49898	Dcr	Install New Box Culvert To Accommodate The Ultimate Roadway Cross Section.	Design	District 1 – Fulton Brock
Tip For Design And R/W	Deer Valley Rd	New River	81.436	Dcr	Construct New Bridge And Four-Lane Road With A Continuous Left Turn Lane.	Dcr	District 4 – Janice Brewer
Scored / Idle	Chandler Heights	Sanokai Wash	7.808946	Car	Replace A Low Water Crossing With A Four-Barrel Reinforced Concrete Box Culvert.	Car	District 1 – Fulton Brock
Scored / Idle	Chandler Heights Rd Channel	Greenfield To Power Rd	3.277609	Car	Construct A Concrete Lined Channel To Convey 100-Year Storm Events.	Car	District 1 – Fulton Brock
Scored / Idle	Gilbert Rd	Eastern Canal	3.259179	Car	Install New Box Culvert To Accommodate The Ultimate Roadway Cross Section.	Car	District 1 – Fulton Brock
Scored / Idle	Guadalupe Rd	Eastern Canal	8.106218	Car	Construct A U-Shape Channel And Replace Pipe With A Box Culvert. Car Recommends Dcr Due To Complexity. ("High-Cost" Alternative Scored).	Car	District 2 – Don Stapley

Status of Bridge/Structure Projects Completed in FY 2000 (July 1, 1999 – June 30, 2000) and 1st Half of FY 2001 (July 1, 2000 – December 31, 2000)

Eight bridge/structure projects were completed in FY 2000 and the first half of FY 2001. Please refer to Table 7, below, for a list of those projects.

Table 7: Status of Bridge/Structure Projects Completed in FY 2000

STRUCT #	NAME	FACILITY	LENGTH	ORIG CONST DATE
8001	Airport Road Bridge	Rid Canal	43	1961
10163	116th Avenue Bridge	Gila River	2548	1998
9692	51 St Ave	Salt River Bridge	1602	1981
7553	Deer Valley Road Bridge	Unnamed Wash Near 189th Avenue	165	1988
8038	Rittenhouse Road Bridge	Queen Creek Wash	180	1996
9849	Bush Highway Bridge	Salt River	480	1991
9427	Peoria Avenue Bridge	New River	304	1972
7820	Mc85 Bridge	Avondale Wash	104	1937

Status of Bridge & Structure Projects Under Construction

There are 10 bridge and structure projects currently in various stages of construction. The following Table 8 is a list of those projects.

Table 8: Status of Bridge & Structure Projects Under Construction

STRUCT #	STATUS	NAME	FACILITY	YEAR CONST	LENGTH	SUFF RATE
08001	Under Construction	Airport Rd	Rid Canal Bridge	1961	43	92.9
09849	To Bid November 1999	Bush Hwy-Fas 388	Salt River Bridge	1991	480	94.4
07553	To Construction Dec 1999	Deer Valley Rd	Wash Bridge	1988	165	98.1
08038	To Bid February 2000	Rittenhouse Rd	Queen Creek Wash Br	1969	180	90.7
09427	Planned Bid March 2000	Peoria Ave-Fau7033	New River Bridge	1972	304	91.8
07820	Planned Bid March 2000	Mc-85 Hwy-Fas 371	Avondale Wash Brdge	1937	104	43.7
07819	Planned Bid Spring 2000	Mc-85hwy-Fas 371	Agua Fria River Br	1973	1203	98.7
09145	Planned Bid Spring 2000	Indian School Rd	Agua Fria River Br	1970	1623	82.8
09999	Planned Bid Spring 2000	Old Us80-Fas 415	Hassayampa River Br	1993	486	99.2
09825	50% Complete	Carefree Highway	Cave Creek Bridge	1983	354	76.9

Status of Bridge & Structure Projects Currently Being Designed

There are currently five bridge projects in various stages of design. The following Table 9 is a list of those projects.

Table 9: Status of Bridge & Structure Projects Currently Being Designed

NAME	FACILITY	STATUS
Queen Creek Road	Eastern Canal	Under Design By Consultant
Loop 303	Grand Avenue	Under Design By Consultant
Roeser Road	Buckeye Feeder Ditch	In-House Design
Chambers Road	Buckeye Feeder Ditch	In-House Design
Williams Road	East Maricopa Floodway	In-House Scour Design